

Background

The Earth's crust is constantly moving. As a result, the exact location and elevation of high mountain peaks and the exact location and depth of low ocean trenches are always changing. This change is usually slow, on the order of centimeters or less per year. Because of this constant change, the latitude, longitude, elevation, and depth for exact features (peaks and trenches) also changes.

The highest peak on Earth is **Mt. Everest**, located in eastern Nepal, near the border with Tibet, in the **Himalayan Mountain Range**, which runs from northwest to southeast along northern India and through Nepal. It was named in 1865 after Sir George Everest, the British surveyor-general of India.

The lowest ocean depth on Earth is called the **Challenger Deep** and is located beneath the western Pacific Ocean - Philippine Sea in the southern end of the **Mariana Trench**, which runs roughly north - south about 1700 km due east of the Philippines and several hundred km southwest of the United States island of Guam. It was named after the British survey ship Challenger II, which first surveyed the trench in 1951.



◆ Note: The lowest ocean depth is about 6325 km east southeast of the highest peak.



For this activity, you will use current average or estimated values for latitude, longitude, elevation, and depth to graph elevations and depths versus longitudes at the given latitude of Mt. Everest - Himalayan Mountain Range and the given latitude of the Challenger Deep - Mariana Trench.





Procedure

To graph the elevation of Earth’s highest peak, Mt Everest in the Himalayan Mountain Range, follow these steps:

1. Using Figure A1.1, along the x-axis (horizontal) at the bottom of the figure, number the longitude values from 86.0 to 88.0 in increments of 0.1.
2. Label the x-axis “Longitude in Degrees East”.
3. Using Figure A1.1, along the y-axis (vertical) on the left side of the figure, number the elevation values from 0 to 10,000 in increments of 500. Start at the bottom and work up.
4. Label the y-axis “Elevation in Meters”.
5. Using the data from Table A1.1, plot the points on Figure A1.1.
6. Connect each point to construct your line graph.
7. Write a title for your graph.

Longitude (Degrees East)	86.0	86.1	86.2	86.3	86.4	86.5	86.6
Elevation (Meters)	3544	4370	2681	4648	6546	5972	4879
Longitude (Degrees East)	86.7	86.8	86.9	87.0	87.1	87.2	87.3
Elevation (Meters)	5152	5192	8593	5997	6322	4595	4439
Longitude (Degrees East)	87.4	87.5	87.6	87.7	87.8	87.9	88.0
Elevation (Meters)	3316	4223	5053	4932	5914	5508	6442

Table A1.1. Mt. Everest - Himalayan Mountain Range - 28 Degrees North Latitude - Longitude and Elevation Data

To graph the depth of the lowest point in the ocean, the Challenger Deep in the Mariana Trench - western Pacific Ocean, follow these steps:

1. Using Figure A1.2, along the x-axis (horizontal) at the bottom of the figure, number the longitude values from 144.0 to 146.0 in increments of 0.1.
2. Label the x-axis “Longitude in Degrees East”.
3. Using Figure A1.2, along the y-axis (vertical) on the left side of the figure, number the depth values from 0 to -10,000 in increments of 500. Since you are graphing depth, begin with zero at the top and work down.





4. Label the y-axis “Depth in Meters”.
5. Using the data from Table A1.2, plot the points on Figure A1.2.
6. Connect each point to construct your line graph.
7. Write a title for your graph.

Longitude (Degrees East)	144.0	144.1	144.2	144.3	144.4	144.5	144.6
Depth (Meters)	-6448	-6307	-8030	-8281	-8898	-8998	-10187
Longitude (Degrees East)	144.7	144.8	144.9	145.0	145.1	145.2	145.3
Depth (Meters)	-10102	-9618	-9754	-9064	-8671	-8263	-7700
Longitude (Degrees East)	145.4	145.5	145.6	145.7	145.8	145.9	146.0
Depth (Meters)	-7245	-7228	-6937	-6735	-6423	-6219	-5865

Table A1.2. Challenger Deep - Mariana Trench - 12.1 Degrees North Latitude - Longitude and Depth Data



Questions

1. Define topography and bathymetry.
2. When measured from sea level, which is greater - the highest mountain peak on the Earth’s surface or the lowest depth in the Earth’s oceans?
3. After you decide which is greater - the highest peak or the lowest depth - calculate the difference.
4. In the box below, draw a bar graph showing the relative vertical distance of the Challenger Deep - Mariana Trench, Mt. Everest - Himalayan Mountain Range, average depth of all the world’s oceans (3730 meters), and average height of all the world’s land (870 meters). (Hint: the ocean’s depths will be below your horizontal line and the land elevations will be above the line.)





Conclusion

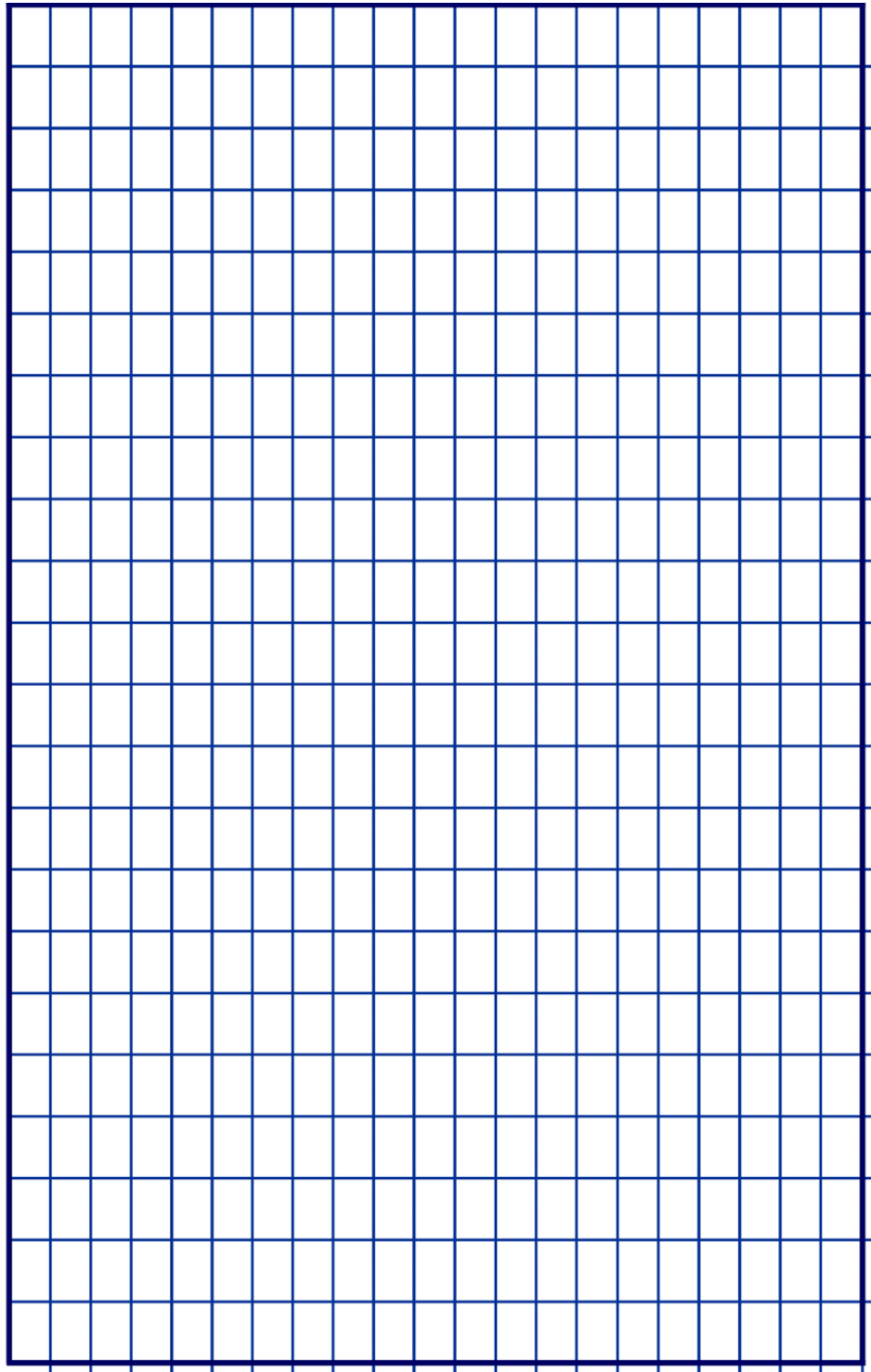
Review the problem stated on the first page and write a detailed conclusion.

A large, empty rectangular area defined by a dashed black border, intended for the student to write their conclusion.





Title:



**Figure A1.1. Elevation versus Longitude at 28 Degrees North Latitude -
Mt. Everest - Himalayan Mountain Range**





Title: _____

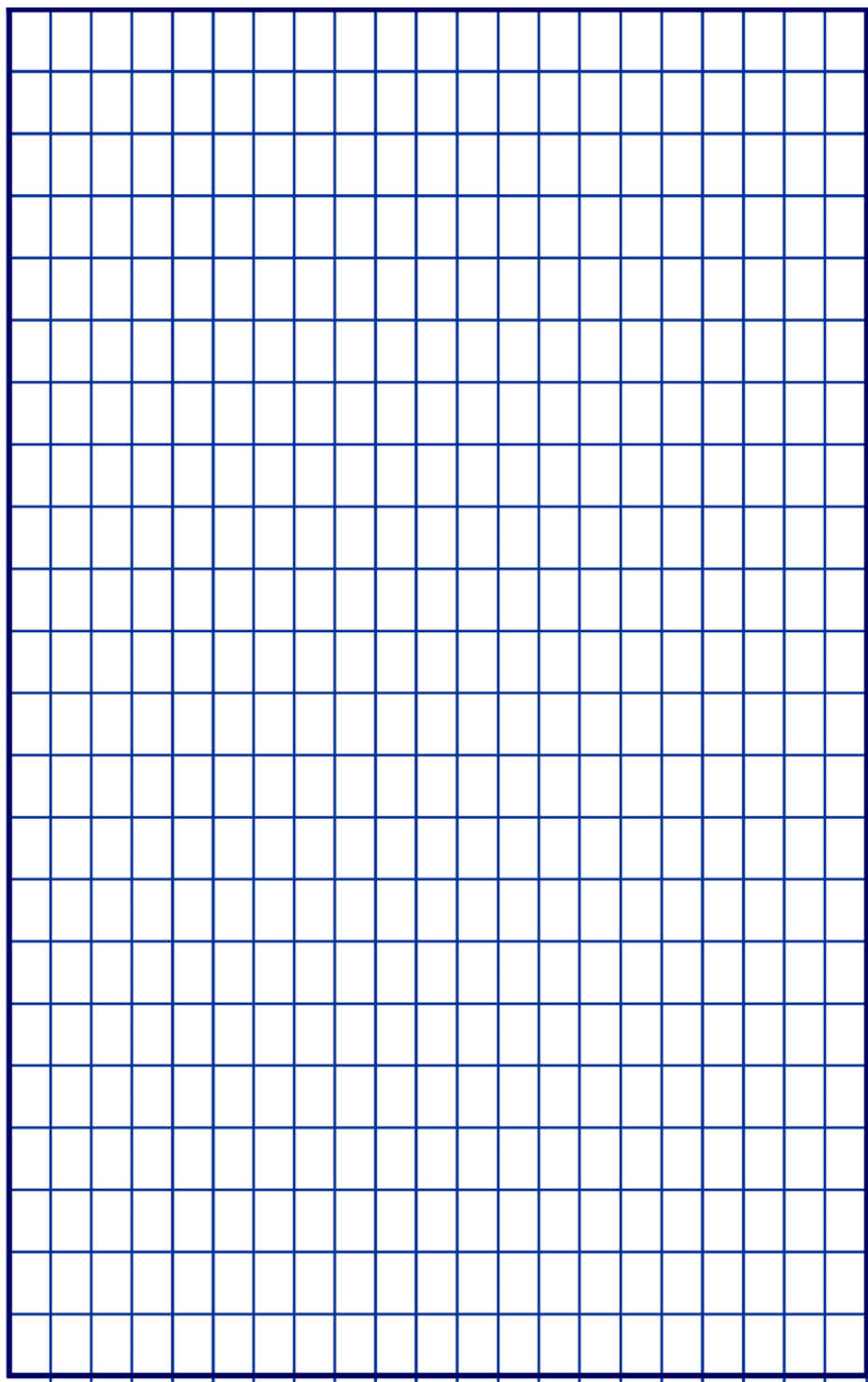


Figure A1.2. Depth versus Longitude at 12.1 Degrees North Latitude - Challenger Deep - Mariana Trench





Answer Key

1. **Topography** - Surface features of a place or region that show relative positions or elevations.

Bathymetry - Measuring depths of the ocean.

2. Lowest depth in the ocean.

3. The Challenger Deep - Mariana Trench is 1594 meters deeper than Mt. Everest - Himalayan Mountain Range is high.

4. Accept any reasonable bar graph that accurately shows the relative distances. Similar to the following...

